

# Ankur Sikarwar

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## Education

Present	<b>Université de Montréal</b>	Montreal, Canada
Sept 2024	Master's of Science (Thesis)   Computer Science   Start Date: 2 September 2024 GPA: 4.2 / 4.3	
June 2021	<b>Birla Institute of Technology, Mesra</b>	India
July 2017	Bachelor of Engineering   Electronics & Communication First Class with Distinction	

## Research & Industrial Experience

Present	<b>Mila - Quebec AI Institute</b>	Montreal, Canada
Aug 2024	Research Assistant   Advisor: <a href="#">Prof. Aishwarya Agrawal</a> <ul style="list-style-type: none"><li>&gt; Working on VLM-based multi-agent frameworks for collaborative spatial reasoning and communication.</li><li>&gt; Developed EARL, a reinforcement learning-based autoregressive model for text-guided image editing, achieving state-of-the-art results with significantly less training data.</li></ul>	
Aug 2023	<b>Massachusetts Institute of Technology   Center for Brains, Minds and Machines</b>	Cambridge, USA
	Research Fellow   Advisor: <a href="#">Dr. Andrei Barbu</a> , <a href="#">Dr. Mengmi Zhang</a> <ul style="list-style-type: none"><li>&gt; Built WorM, a comprehensive benchmark of 1M trials and 10 tasks, to study working memory in AI systems.</li><li>&gt; Explored orthogonal representation regularization to mitigate forgetting and improve compositional generalization in continual learning tasks.</li></ul>	
Jun 2024	<b>Agency for Science, Technology and Research   Institute for Infocomm Research</b>	Singapore
Oct 2022	Research Engineer   Advisor: <a href="#">Dr. Mengmi Zhang</a> <ul style="list-style-type: none"><li>&gt; Developed SeCo, a self-supervised framework with external memory for context-aware visual reasoning.</li><li>&gt; Designed large-scale Turing test frameworks to benchmark vision-language AI models against humans.</li><li>&gt; Developed curriculum algorithms to optimize continual learning, enhancing forward transfer and reducing catastrophic forgetting.</li></ul>	
Aug 2022	<b>Microsoft Research</b>	Bangalore, India
July 2021	Research Intern   Advisor: <a href="#">Dr. Navin Goyal</a> <ul style="list-style-type: none"><li>&gt; Developed multimodal models for compositional generalization in grounded language understanding tasks.</li><li>&gt; Worked on the mechanistic interpretability of grounding and composition in multimodal transformers.</li><li>&gt; Explored modular neural networks, enhancing faithfulness of individual reasoning modules.</li></ul>	
July 2021	<b>Harvard University   Kreiman Lab</b>	Cambridge, USA
Jan 2021	Research Assistant   Advisor: <a href="#">Prof. Gabriel Kreiman</a> <ul style="list-style-type: none"><li>&gt; Explored how question semantics influence attention and grounding in visual question answering models.</li><li>&gt; Investigated the role of co-attention transformer layers in multimodal transformers, comparing model attention with human attention to improve interpretability.</li></ul>	
July 2019	<b>IIIT, Hyderabad   Center for Visual Information Technology</b>	Hyderabad, India
May 2019	Research Intern   Advisor: <a href="#">Prof. Avinash Sharma</a> <ul style="list-style-type: none"><li>&gt; Worked on an end-to-end network for reconstructing 3D models of humans from monocular video.</li><li>&gt; Developed tools for pre-processing &amp; generating 3D mesh data of humans from a vertex-based template model.</li></ul>	

## Publications

### The Promise of RL for Autoregressive Image Editing. [📄](#) [🔗](#)

Saba Ahmadi\*, Rabiu Awal\*, [Ankur Sikarwar](#)\*, Amirhossein Kazemnejad\*, Ge Ya Luo, Juan A. Rodriguez, Sai Rajeswar, Siva Reddy, Christopher Pal, Benno Krojer, Aishwarya Agrawal (\*Denotes equal contribution)  
Conference on Neural Information Processing Systems. [NeurIPS'25]

### Decoding the Enigma: Benchmarking Humans and AIs on the Many Facets of Working Memory. [📄](#) [🔗](#)

[Ankur Sikarwar](#), Mengmi Zhang  
Conference on Neural Information Processing Systems. [NeurIPS'23]

### Learning to Learn: How to Continuously Teach Humans and Machines.

Parantak Singh, You Li, [Ankur Sikarwar](#), Weixian Lei, Daniel Gao, Morgan Bruce Talbot, Ying Sun, Mike Zheng Shou, Gabriel Kreiman, Mengmi Zhang

*International Conference on Computer Vision.*

[ICCV'23]

### When Can Transformers Ground and Compose: Insights from Compositional Generalization Benchmarks.

[Ankur Sikarwar](#), Arkil Patel, Navin Goyal

*Conference on Empirical Methods in Natural Language Processing.*

[EMNLP'22 (Oral)]

### Reason from Context with Self-supervised Learning.

Xiao Liu, [Ankur Sikarwar](#), Joo Hwee Lim, Gabriel Kreiman, Zenglin Shi, Mengmi Zhang

[In Review]

### Human or Machine? Turing Tests for Vision and Language.

Mengmi Zhang, Giorgia Dellafererra, [Ankur Sikarwar](#), Marcelo Armendariz, Noga Mudrik, Prachi Agrawal, Spandan Madan, Mranmay Shetty, Andrei Barbu, Haochen Yang, Tanishq Kumar, Shui'Er Han, Aman Raj Singh, Meghna Sadwani, Stella Dellafererra, Michele Pizzochero, Brandon Tang, Hanspeter Pfister, Gabriel Kreiman

[In Review]

### On the Efficacy of Co-Attention Transformer Layers in Visual Question Answering.

[Ankur Sikarwar](#), Gabriel Kreiman

*Preprint.*

## Achievements and Awards

**UdeM-Bourse d'exemption, 2024** Awarded the UdeM-Bourse d'exemption grant of CAD 15,149 to pursue graduate studies.

**Mila Scholarship, 2024** Awarded the Mila scholarship of CAD 27,000/year to pursue graduate studies.

**Fujitsu Laboratories Fellowship, 2023**  Received the prestigious Fujitsu Laboratories fellowship for [MIT Center for Brains, Minds and Machines](#) Summer Program. Only undergraduate student to be selected from a pool of 300+ graduate-level applicants.

**iHack Alpha: AI-Enabled Solutions, 2021** Among Top 8 Finalists globally.

**NASA International Space Apps Challenge, 2019 | Global Nominee**  For designing “Prophet: A distributed system for identifying and mitigating lunar dust for future moon missions.”

**Bengaluru Tech Summit Global Hackathon, 2019 | Top 20 Finalists**   For developing “FOCUS: A Wearable Device for People with Speech and Motor Impairments.”

**Siemens MakeIT Real Hackathon, 2018 | Winner**   For building the winning prototype “TetraChrome Lenses: Smart Glasses for Visually Impaired People” within 24 hours.

## Volunteering and Leadership Positions

### Academic Service

2022-Present

- Served as a peer reviewer for top-tier conferences including NeurIPS'25, NeurIPS'23, EMNLP'23, ACL'23, EMNLP'22.

### Journal Club Organizer

2022-2024

- Led weekly reading sessions at the Deep NeuroCognition Lab, A\*STAR Singapore, selecting papers, inviting guest speakers, and moderating discussions.

### National Service Scheme

2017-2021

- Actively participated in STEM outreach programs, mentoring and engaging underprivileged students through hands-on activities and demonstrations.
- Promoted accessibility in STEM by building assistive technologies for visually impaired students; tested and refined prototypes with students at a school for the blind.

## Talks

### “Decoding the Enigma: Benchmarking Humans and AIs on the Many Facets of Working Memory”

› Libedinsky Lab, National University of Singapore 

July 2023

### “When Can Transformers Ground and Compose: Insights from Compositional Generalization Benchmarks”

› Lab Sabha, [Microsoft Research India](#)

July 2022

### “On the Efficacy of Co-Attention Transformer Layers in Visual Question Answering”

› Kreiman Lab, Harvard University 

June 2021